4.3 BIOLOGICAL RESOURCES

This section discusses the potential effects of the construction and operation of the proposed Tucson Electric Power Company (TEP) Sahuarita-Nogales Transmission Line Project within each alternative corridor. The methodology for determining impacts is presented, followed by a description of the impacts from each alternative.

Methodology

The biological resource impact analysis consists of an evaluation of the effects generated by the construction and operation of a proposed action, for all land jurisdictions on specific biological resources (for example, vegetation communities). Additional analysis of the U.S. Department of Agriculture Forest Service (USFS) and Bureau of Land Management (BLM) land has been included to assist those agencies in evaluating impacts to unique or specific resources under their administration. This additional analysis is not appropriate for resources outside of their jurisdiction because their authority only covers land under their administration. Impacts to biological resources are described relative to the affected environment in Section 3.3.1.

To determine if an action may cause a significant impact, both the context of the proposed action and the intensity of the impact are considered. For actions such as those proposed in this document, the context is the locally affected area and significance depends on the effects in the local area. The intensity of the impact is primarily considered in terms of any unique characteristics of the area (for example, presence of special-status species) and the degree to which the proposed action may adversely affect such unique resources. Impacts would be significant if the proposed action or alternatives change the biological resources in the long term.

4.3.1 Biodiversity

Biodiversity in the area results from the convergence of the climatic zones, topographic relief (range of elevations), variable geology, and precipitation patterns (Wildlands Project 2000). The proposed project would not alter these factors on a scale that would cause a regional decline in biodiversity. Potential impacts to species listed by the U.S. Fish and Wildlife Service (USFWS), USFS, BLM, or the Arizona Game and Fish Department (AGFD) are provided in the remainder of Section 4.3.

4.3.1.1 *Western, Central, and Crossover Corridors*

Impacts to biodiversity for the three proposed corridors would be similar. Individual plant and animal species whose occurrences are considered rare in the proposed corridors may be directly or indirectly impacted through the construction, maintenance, and/or operation of the proposed powerline. No decline in the biodiversity of the region is anticipated as a result of the three proposed corridors.

4.3.1.2 *No Action Alternative*

No impacts to biodiversity would result under this alternative. Existing biodiversity would continue as described in Section 3.3.1.

4.3.2 Vegetation and Wildlife

Impacts to vegetation would be similar under all action alternatives. Potential impacts to vegetation and wildlife, as a result of the construction of the transmission line include loss or disturbance to existing native plant communities and potential adverse effects to wildlife including some mortality of individual

wildlife, interference with breeding, loss of habitat, and loss of forage plants. Impacts would result from construction of temporary access roads and lay down yards, construction of poles and permanent access roads, clearing of vegetation, and line maintenance. Impacts to vegetation were calculated based on preliminary siting of access roads that are approximately 12 ft (3.7 m) wide and a 100 ft (30 m) radius around each pole location (see Section 4.12, Transportation, for discussion on revegetation with native species). Short-term disturbances of previously undisturbed biological habitats from the construction of the transmission line and substations could cause long-term reductions in the biological productivity of an area. These long-term effects tend to be more pronounced in arid areas such as the proposed project area where biological communities recover very slowly from disturbances. Refer to Figure 3.3–1 for a map of the vegetation types in the following sections.

4.3.2.1 *Western Corridor*

Potential impacts to vegetation in the Western Corridor are summarized in Table 4.3–1.

Table 4.3–1. Estimated Area of Vegetation Communities Potentially Disturbed in the Western Corridor.

Vegetation Type	Entire Corridor (acres)	Coronado National Forest[a] (acres)	Lands Administered by the BLM (acres)	All Other Land Ownership (acres)
AZ Upland/Sonoran Desertscrub	119	0	0	119
Semidesert Grassland	165	102	8	55
Madrean Evergreen Woodland	95	95	0	0
Sonoran Riparian Deciduous Forest	0.14	0	0	0
Disturbed (agriculture, urban, or unvegetated)	3	0	0	3
USFS Classified Riparian	NA	0.6	NA	NA
Total	**382.14**	**197.6**	**8**	**177**

[a] Source: Roads Analysis (URS 2003a).

USFS Classified Riparian. Impacts to USFS Classified Riparian only apply to riparian vegetation on lands administered by USFS because this classification system is unique to that agency. Impacts to USFS Classified Riparian areas are based on those identified in the Roads Analysis for the proposed project (URS 2003a). Under this alternative, an estimated 0.6 acres (0.2 ha) of dry desert riparian habitat would be impacted. No impacts to deciduous riparian or evergreen riparian are anticipated. This is considered to be a minor impact because only a relatively small percentage of this vegetation would be disturbed compared to the overall amount present on national forest lands.

Wildlife. Impacts to wildlife as a result of construction would include mortality of smaller species such as rodents, reptiles, and amphibians. Additional impacts to wildlife include the loss of food, cover, and breeding sites. The construction of new access roads would also increase public access into new areas which may result in disturbances to wildlife and their habitat by human use. Construction of the line in the Western Corridor would be unlikely to impede the movements of animals because they would not

present major barriers. However, construction of access roads, pole sites, and lay down areas would alter microclimatic conditions on either side. These impacts are unlikely to substantially reduce wildlife populations in the region because of the relatively small areas impacted. Additional impacts would include the potential for mortality of birds and bats resulting from collisions with the lines. Impacts to birds are discussed further in Section 4.3.4.

4.3.2.2 *Central Corridor*

Potential impacts to vegetation in the Central Corridor are summarized in Table 4.3–2.

Table 4.3–2. Estimated Area of Vegetation Communities Potentially Disturbed in the Central Corridor.

Vegetation Type	Entire Corridor (acres)	Coronado National Forest[a] (acres)	Lands Administered by the BLM (acres)	All Other Land Ownership (acres)
AZ Upland/Sonoran Desertscrub	119	0	0	119
Semidesert Grassland	109	67	8	34
Madrean Evergreen Woodland	38	38	0	0
Sonoran Riparian Deciduous Forest	0	0	0	0
Disturbed (agriculture, urban, or unvegetated)	3	0	0	3
USFS Classified Riparian	NA	0.1	NA	NA
Total	**269**	**105.1**	**8**	**156**

[a] Source: Roads Analysis (URS 2003a).

USFS Classified Riparian. Under this alternative, an estimated 0.1 acres (0.04 ha) of dry desert riparian habitat would be impacted. No impacts deciduous riparian or evergreen riparian are anticipated. This is considered to be a minor impact because only a relatively small percentage of this vegetation would be disturbed compared to the overall amount present on USFS system lands.

Wildlife. Impacts to wildlife would generally be the same as those listed above under Section 4.3.2.1. However, differences in the impacts to wildlife could vary as a result of different amounts of vegetation types disturbed in each corridor.

4.3.2.3 *Crossover Corridor*

Potential impacts to vegetation in the Crossover Corridor are summarized in Table 4.3–3.

USFS Classified Riparian. Under this alternative no impacts to USFS Classified Riparian are anticipated.

Table 4.3–3. Estimated Area of Vegetation Communities Potentially Disturbed in the Crossover Corridor.

Vegetation Type	Entire Corridor (acres)	Coronado National Forest[a] (acres)	Lands Administered by the BLM (acres)	All Other Land Ownership (acres)
AZ Upland/Sonoran Desertscrub	119	0	0	119
Semidesert Grassland	97	66	8	23
Madrean Evergreen Woodland	72	72	0	0
Sonoran Riparian Deciduous Forest	0	0	0	0
Disturbed (agriculture, urban, or unvegetated)	3	0	0	3
USFS Classified Riparian	NA	0	NA	NA
Total	**291**	**138**	**8**	**145**

[a] Source: Roads Analysis (URS 2003a).

Wildlife. Impacts to wildlife would be the same as those listed above under Section 4.3.2.1. However, differences in the impacts to wildlife could vary as a result of different amounts of vegetation types disturbed in each corridor.

4.3.2.4 *No Action Alternative*

There would be no impact to vegetation and wildlife associated with the No Action Alternative. Existing conditions would continue as described in Section 3.3.2.

4.3.3 Special Interest Species

Harris Environmental Group prepared draft Biological Assessments per the USFWS Section 7 Handbook (USFWS 1998) contained in Appendices D, E, and F of this Environmental Impact Statement (EIS) for the Western, Central, and Crossover Corridors, respectively (HEG 2003a, 2003b, 2003c). All of the action alternatives would have the potential to impact species listed under the *Endangered Species Act* (ESA), as amended. Therefore, the U.S. Department of Energy (DOE) has initiated consultation with USFWS under Section 7(a)(2) of the ESA. The formal consultation process between DOE, USFS, BLM, and USFWS will begin when DOE tenders its biological assessment of the alternatives to the USFWS. During formal consultation USFWS will: (1) review all relevant information provided by DOE, USFS, and BLM; (2) evaluate the current status of the listed species and critical habitat; (3) evaluate the effects of the action and cumulative effects on the listed species or critical habitat; and (4) formulate a biological opinion as to whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Upon completion of the review and evaluation, USFWS will discuss the findings in the biological opinion with DOE, USFS, BLM, and TEP. USFWS will identify the availability of any reasonable and prudent

alternatives, including mitigation, that DOE, USFS, BLM, and TEP can implement to avoid "take" (harm or harassment of a threatened or endangered species) as defined in the ESA.

The main impact on special interest species would result from the destruction or alteration of a species habitat and the increase in human activity. Additionally, the increased potential for wildfires as a result of sparks from vehicles is a potential impact common to all of the action alternatives (HEG 2003a, 2003b, 2003c). Wildfires that start as a result of the proposed project have the potential to impact one or more special-status species, including threatened and endangered species. Additionally, ground disturbances could facilitate the establishment of nonnative species, such as Lehman's lovegrass, which could alter the natural fire regime. "Wildfires could remove ground cover that is important in dissipating rainfall energy and reducing erosion" (HEG 2003a, 2003b, 2003c). Increased erosion as a result of wildfires could harm all of the fish and frog species listed in Table 4.3–4.

For threatened and endangered species, three types of effects determinations were made:

1. *No effect* determinations were not quantified because there are no effects. No effect means that there are absolutely no effects of the project, positive or negative, on a species.

2. *May affect/not likely to adversely affect* determinations mean that all impacts are beneficial, insignificant, or discountable. Such determinations require concurrence from the USFWS. These determination were not quantified because "based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur" (USFWS 1998).

3. *May affect/likely to adversely affect* determinations were evaluated according to the primary action causing the indirect adverse effect (for example, erosion from roads increasing sediment load into watersheds). While this may not realistically reflect the magnitude of effect to individual species, the consistency of evaluation across the three corridors allows for comparisons between them. This determination means that there is at least one adverse effect of the proposed action and requires formal consultation with the USFWS.

Table 4.3–4 summarizes the determination of effects for all species considered in the Biological Assessments for all of the corridors. These determinations were made based on contact with the USFWS, USFS, BLM, and AGFD regarding all species potentially affected by the project. Determinations were made after reviewing the current status of each species, the environmental baseline of each alternative, and the effects of the proposed actions (including the cumulative effects) (HEG 2003a, 2003b, 2003c). Species for which it was determined that the project "may affect" are discussed below in Sections 4.3.3.1 to 4.3.3.3. Detailed discussions are included in the Biological Assessments (see Appendices D, E, and F) appended to this EIS.

Table 4.3–4. Effects Determination of Threatened and Endangered Species Potentially Occurring in Pima and Santa Cruz Counties, Arizona.

Species	Western Corridor	Central Corridor	Crossover Corridor
Plants			
Canelo Hills Ladies' Tresses	No Effect	No Effect	No Effect
Huachuca Water Umbel	No Effect	No Effect	No Effect
Kearney's Blue Star	No Effect	No Effect	No Effect
Nichol's Turk's Head Cactus	No Effect	No Effect	No Effect
Pima Pineapple Cactus	**May affect, likely to adversely affect**	**May affect, likely to adversely affect**	**May affect, likely to adversely affect**
Mammals			
Jaguar	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**
Jaguarundi	No Effect	No Effect	No Effect
Lesser Long-nosed Bat	**May affect, likely to adversely affect**	**May affect, likely to adversely affect**	**May affect, likely to adversely affect**
Mexican Gray Wolf	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**
Sonoran Pronghorn	No Effect	No Effect	No Effect
Ocelot	No Effect	No Effect	No Effect
Birds			
Bald Eagle	No Effect	No Effect	No Effect
Brown Pelican	No Effect	No Effect	No Effect
Cactus Ferruginous Pygmy-owl	**May affect, likely to adversely affect**	**May affect, likely to adversely affect**	**May affect, likely to adversely affect**
Mexican Spotted Owl	**May affect, *not* likely to adversely affect**	No Effect	**May affect, *not* likely to adversely affect**
Masked Bobwhite	No Effect	No Effect	No Effect
Mountain Plover	No Effect	No Effect	No Effect
Northern Aplomado Falcon	No Effect	No Effect	No Effect
Southwestern Willow Flycatcher	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**
Amphibians			
Chiricahua Leopard Frog	**May affect, likely to adversely affect**	No Effect	**May affect, *not* likely to adversely affect**
Sonoran Tiger Salamander	No Effect	No Effect	No Effect
Fish			
Desert Pupfish	No Effect	No Effect	No Effect
Gila Top Minnow	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**	**May affect, *not* likely to adversely affect**
Loach Minnow	No Effect	No Effect	No Effect
Sonora Chub	**May affect, likely to adversely affect; may affect, not likely to adversely modify critical habitat**	No Effect	No Effect
Spikedace	No Effect	No Effect	No Effect
Gila Chub	No Effect	No Effect	No Effect

Source: HEG 2003a, b, and c.

With the exception of Sonora chub (see Section 3.3), no impacts to critical habitat, either proposed or currently designated at the time this Draft EIS is published, would occur under any of the alternatives. Any potential effects on threatened and endangered species are provided below. Detailed information about these species is presented in the Biological Assessments (see Appendices D, E, and F).

Harris Environmental Group (HEG 2003a, 2003b, 2003c) evaluated potential impacts to USFS Sensitive species to determine if there is: (1) a downward trend in population numbers, or (2) a downward trend in habitat capability that would reduce a species' existing distribution. With the exception of supine bean, the potential impacts under the Western, Central, and Crossover Corridor Alternatives would not result in a downward trend in population numbers or a downward trend in habitat capability. This determination was made by reviewing each species population, distribution, and habitat requirements and the proposed impacts. Generally, no downward population or habitat trends are expected for one or more of the following reasons:

- Other viable populations are present outside of the corridors but within the Tumacacori Ecosystem Management Areea (EMA) of the Coronado National Forest, or within other mountains in southern Arizona;
- Only a small percentage of the total population would potentially be impacted;
- Minimal suitable habitat is present in the corridor;
- Only a small percentage of foraging habitats would potentially be impacted;
- Some of the plant species are adapted to disturbed habitat; or
- The only known populations are outside of the corridors.

Harris Environmental Group determined that current information regarding supine bean is too limited to determine if potential impacts would cause any downward population or habitat trends. Therefore, further consultation with USFS and, if necessary, surveys would be conducted to avoid impacts. Table 4.3–5 summarizes the potential impacts to USFS Sensitive Species under each alternative.

No surveys for USFS Sensitive Species, BLM Sensitive Species, Wildlife of Special Concern, or plants listed by the Arizona Department of Agriculture (ADA) have been conducted. Therefore, the presence of these species was assumed in all areas containing potential habitat (HEG 2003a, 2003b, 2003c).

Table 4.3–5. Impacts to Forest Service Sensitive Species.

Common Name	Present in Corridor	Effects Determination By Corridor
Plants		
Alamos Deer Vetch	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Arid Throne Fleabane	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Arizona Giant Sedge	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Bartram's Stonecrop	All	Western - May impact individuals but not likely to result in trend toward listing or loss of population viability. Crossover & Central - No effects are anticipated.

Table 4.3–5. Impacts to Forest Service Sensitive Species (*continued*).

Common Name	Present in Corridor	Effects Determination By Corridor
Beardless Chinch Weed	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Broad-leaf ground cherry	Central, Crossover	All - No effects are anticipated.
Catalina Beardtongue	All	Western - May impact individuals but not likely to result in trend toward listing or loss of population viability. Crossover & Central - No effects are anticipated.
Chiltepin	All	Western - No effects are anticipated. Crossover & Central - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Chihuahuan Sedge	Western Crossover	Western & Crossover - May impact individuals but not likely to result in trend toward listing or loss of population viability. Central - No effects are anticipated.
Chiricahua Mountain Brookweed	All	All - Minimal or no effects are anticipated. Not likely to result in trend toward listing or loss of population viability.
Foetid Passionflower	All	All - Minimal or no effects are anticipated. Not likely to result in trend toward listing or loss of population viability.
Gentry Indigo Bush	All	All - Minimal or no effects are anticipated. Not likely to result in trend toward listing or loss of population viability.
Large-Flowered Blue Star	All	All - Minimal or no effects are anticipated. Not likely to result in trend toward listing or loss of population viability.
Lumholtz Nightshade	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Mock-Pennyroyal	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Nodding Blue-eyed Grass	All	All - No effect is anticipated.
Pima Indian Mallow	Central, Crossover	Western - No effect is anticipated. Central - No effect on population status and is not likely to result in a trend towards Federal listing. Crossover - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Santa Cruz Beehive Cactus	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Santa Cruz Star Leaf	All	Western & Crossover - May impact individuals but not likely to result in trend toward listing or loss of population viability. Central - No effect on population status and is not likely to result in a trend towards Federal listing.
Santa Cruz Striped Agave	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Seeman Groundsel	All	Western - May impact individuals but not likely to result in trend toward listing or loss of population viability. Central & Crossover - No effect on population status and is not likely to result in a trend towards Federal listing.
Sonoran Noseburn	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Superb Beardtongue	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Supine Bean	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability. Given recent population trends, additional surveys may be warranted upon selection of a preferred alternative. USFS would be consulted prior to impacting any known populations.

Table 4.3–5. Impacts to Forest Service Sensitive Species (*continued*).

Common Name	Present in Corridor	Effects Determination By Corridor
Sweet Acacia	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Three-nerved scurf-pea	Crossover	Western & Central - No effect on population status and is not likely to result in a trend towards Federal listing. Crossover - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Thurber Hoary Pea	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Thurber's Morning-glory	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Virlet Paspalum	All	All - No effect on population status and is not likely to result in a trend towards Federal listing.
Weeping Muhly	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Wiggins Milkweed Vine	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Wooly Fleabane	All	Western - May impact individuals but not likely to result in trend toward listing or loss of population viability. Central & Crossover - No effect on population status and is not likely to result in a trend towards Federal listing.
Mammals		
Cave Myotis	All	All - Forage habitat may be disturbed but not likely to result in trend toward listing or loss of population viability.
Southern Pocket Gopher	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.
Birds		
American Peregrine Falcon	All	All - Not likely to impact nesting sites and not likely to result in trend toward listing or loss of population viability.
Five-Stripped Sparrow	Western Crossover	Minimal or no effects are anticipated. Not likely to result in trend toward listing or loss of population viability.
Northern Gray Hawk	All	All - No effect on population status and is not likely to result in a trend towards Federal listing.
Yellow-billed Cuckoo	All	All - Minimal or no effects are anticipated. Not likely to result in trend toward listing or loss of population viability assuming impacts to riparian vegetation are avoided or minimized.
Reptiles/Amphibians		
Giant Spotted Whiptail	All	All - No effect on population status and is not likely to result in a trend towards Federal listing.
Lowland Leopard Frog	All	All - No effect on population status and is not likely to result in a trend towards Federal listing.
Mexican Garter Snake	All	Western - No effect on population status and is not likely to result in a trend towards Federal listing. Central & Crossover - May impact individuals if riparian areas are impacted. Not likely to result in a trend towards Federal listing.
Western Barking Frog	All	All - No effect on population status and is not likely to result in a trend towards Federal listing.
Invertebrates		
Arizona Metalmark	All	All - May impact individuals but not likely to result in trend toward listing or loss of population viability.

Source: HEG 2003a, b, and c.

Arizona Department of Agriculture Species. On private lands, such as those within the proposed project area, salvage of species on the ADA List of Protected Native Plants (State of Arizona 1997) is not required for private landowners. Under state law, landowners have the right to destroy or remove plants growing on their land including all cacti, yucca, and other succulent species. Because the proposed project is a Federal action, the ADA would be notified if plants within the ROW would be removed and later transplanted or permanently destroyed. An ADA Notice of Intent (NOI) to clear land is required 20 to 60 days prior to the destruction of any plants. Further study would be performed as needed upon precise siting of the ROW within the Western Corridor.

4.3.3.1 *Western Corridor*

Impacts to 10 of the 27 species listed by USFWS would occur under this alternative and are detailed in the Biological Assessment (Appendix D). A summary of impacts to these species are discussed below.

Cactus Ferruginous Pygmy-owl (Endangered). Construction of the Western Corridor may affect, and is likely to adversely affect cactus ferruginous pygmy-owls (HEG 2003a). Although no cactus ferruginous pygmy-owls are known to occur in surveyed areas in the Western Corridor, habitat for this species is present (see section 3.3.3.1). A preliminary assessment of construction-related impacts indicates the following cactus ferruginous pygmy-owl habitat types would be altered: 34 acres (9 ha) of Sonoran Desertscrub, 46 acres (18 ha) of Desert Riparian Scrub, and 3 acres (1 ha) of Deciduous Riparian. According to the Harris Environmental Group (HEG 2003a), "short term noise disturbance and human activity associated with construction may temporarily discourage cactus ferruginous pygmy-owl use of habitat within and immediately adjacent to the proposed right-of-way." Further impacts include modification of habitat due to clearing vegetation and building project structures and an increase in human activities as a result of new access. Due to these potential impacts, construction of the Western Corridor may affect, and is likely to adversely affect, cactus ferruginous pygmy-owls (HEG 2003a).

To minimize potential adverse impacts to cactus ferruginous pygmy-owls, construction activities during breeding season would only occur following additional surveys, and the Conservation Measures outlined in Section 1.4 of the Biological Assessment (HEG 2003a) would be used. If these measures were employed, impacts to cactus ferruginous pygmy-owls would not be expected to rise to the level of take.

According to Harris Environmental Group (HEG 2003a), "No take of CFPO [cactus ferruginous pygmy-owl] is anticipated for the following reasons: (1) construction activities during breeding season would only occur following protocol surveys; (2) the Conservation Measures outlined in Section 1.4 (of the Biological Assessment) will minimize disturbance to potential habitat and prevent disturbance to nesting CFPO within the action area should any be detected in the future."

Chiricahua Leopard Frog (Threatened). Construction of the Western Corridor may affect, and is likely to adversely affect Chiricahua leopard frogs (HEG 2003a). No direct impacts to Chiricahua leopard frog habitat (i.e., stock tanks or other aquatic habitats) would occur under this alternative because no construction activities would occur in these habitats. Individuals could be present, however, on land some distance away from these areas, and construction traffic could result in fatalities from vehicle collisions. Other indirect impacts could occur from removal of vegetation due to construction that could increase surface runoff and sediment into Chiricahua leopard frog habitat. Additional impacts may include the spread of the chytrid fungus, known to cause mortality in frogs, into areas that are not currently accessible by vehicle. Due to these potential impacts, construction of the Western Corridor may affect, and is likely to adversely affect, Chiricahua leopard frogs (HEG 2003a).

To minimize potential adverse impacts to Chiricahua leopard frogs: (1) no construction activities would occur within occupied streams, stock tanks, or other Chiricahua leopard frog habitat; (2) BMPs would be

implemented to minimize erosion; and (3) equipment cleaning stations would be established at appropriate sites to prevent the spread of disease. If these measures were employed, impacts to Chiricahua leopard frogs would not be expected to rise to the level of take.

Gila Topminnow (Endangered). Construction of the Western Corridor may affect, but is not likely to adversely affect Gila topminnows (HEG 2003a). No direct effects to Gila topminnows are anticipated because no construction would occur within occupied habitat. The closest populations are about 12 mi (19 km) east of any of the corridors (see section 3.3.3.1). Some indirect effects to topminnow habitat are possible due to erosion that could result from project construction. Increased surface runoff and sediment transport into Gila topminnow habitat in the Santa Cruz River watershed could occur. Any such effects would be relatively small due to the distance of the proposed project from occupied habitat; BMPs to minimize sediment transport would also be used (HEG 2003a). Due to the real but limited potential for impacts to Gila topminnow, construction of the Western Corridor may affect, but is not likely to adversely affect, this species (HEG 2003a). Any such effects would not be expected to rise to the level of take.

Jaguar (Endangered). Construction of the Western Corridor may affect, but is not likely to adversely affect jaguars (HEG 2003a). Impacts to jaguars may result from noise disturbance associated with construction activities, especially during early morning or late evening hours. However, these impacts would be widely distributed because of the linear nature of the project. Additional impacts would result from habitat modification and fragmentation, and subsequently impacts to prey species, due to the construction of roads and poles. The primary prey of jaguars include deer, which have relatively large home ranges. The proposed project would be unlikely to result in a decline in the regional deer population. In the event that remote monitoring of the Arizona-Mexico border to be undertaken by the Jaguar Conservation Team documents a female jaguar or cubs within the Tumacacori EMA, consultation with USFWS would be reinitiated (HEG 2003a).

Lesser Long-nosed Bat (Endangered). Construction of the Western Corridor may affect and is likely to adversely affect lesser long-nosed bats (HEG 2003a). According to the Biological Assessment (HEG 2003a), "indirect effects to lesser long-nosed bats may result from disturbance (removal) of agaves and saguaro cacti during construction of temporary access roads or the installation of poles." Agaves and saguaro are distributed in patches and the loss of significant numbers of either species may alter foraging patterns, roost selection, or reduce individual survivorship. These impacts, however, would be widely distributed and relatively minor because of the linear nature of the project. Furthermore, forage plants would be transplanted, thereby further lessening impacts, although there could be some impacts from transplantation failure. Any resulting project impacts to lesser long-nosed bats would not be expected to rise to the level of take.

Mexican Gray Wolf (Endangered). Construction of the Western Corridor may affect, but is not likely to adversely affect lesser Mexican gray wolves (HEG 2003a). The proposed action would not affect individual Mexican gray wolves because the species is not present in the project area, and there are no plans by USFWS to re-introduce it to the region. A small amount of potential wolf habitat would be permanently affected, however, by project construction. In the event any Mexican gray wolves moved into or through the project area, they could be impacted by project effects on their prey or by project operations such as patrols by helicopter (HEG 2003a). Any such effects should be small because the project is unlikely to reduce prey on a regional basis, and operational disturbances would be infrequent. Nevertheless, because there could be future impacts due to the project, construction of the Western Corridor may affect, but is not likely to adversely affect, Mexican gray wolves.

Mexican Spotted Owl (Threatened). Construction of the Western Corridor may affect, but is not likely to adversely affect Mexican spotted owls (HEG 2003a). Direct effects on Mexican spotted owls could result from disturbance by construction activities that could discourage nesting in suitable habitat. The

greatest likelihood of noise disturbance would be from use of helicopters during construction of the transmission lines (HEG 2003a). To minimize potential for disturbance from construction, no construction would occur within 1 mi (1.6 km) of the two Protected Activity Centers identified south of Ruby Road (see section 3.3.3.1) during the breeding season of March 1 to August 31 (HEG 2003a). In addition, construction during non-breeding season would be short term. Surveys would be performed in advance of construction in Sycamore Canyon where Mexican spotted owls have been reported but where there are no Protected Activity Centers. Should the species be present, USFWS would be consulted for further guidance.

A short section of access road [0.07 mi (0.113 km)] would be constructed within one of the Protected Activity Centers. Associated impacts should be minor because the only deciduous vegetation present is not of sufficient size to function as structural Mexican spotted owl habitat, and no trees greater than 9 inches (23 cm) in diameter at breast height would be removed (HEG 2003a).

Therefore, the construction-related activities outlined above may affect non-breeding Mexican spotted owls, but would not be likely to adversely affect the species, because construction would occur during a non-critical life stage, would be short term, and should not affect structural habitat function.

Pima Pineapple Cactus (Endangered). Construction of the Western Corridor may affect, and is likely to adversely affect Pima pineapple cacti (HEG 2003a). Construction of the Western Corridor may affect, and is likely to adversely affect, Pima pineapple cacti through hindering seedling establishment (HEG 2003a). Although no individual Pima pineapple cacti would be directly impacted because the locations of poles and access roads would be modified to avoid sensitive areas (HEG 2003a), indirect impacts could occur. These would include new access roads to Pima pineapple cacti populations, thereby exposing these populations to illegal collection. Any adverse effects to this species would be mitigated by purchase of mitigation bank credits (HEG 2003a).

Southwestern Willow Flycatcher (Endangered). Construction of the Western Corridor may affect, but is not likely to adversely affect southwestern willow flycatchers (HEG 2003a). Construction of the Western Corridor may affect, but is not likely to adversely affect, southwestern willow flycatchers (HEG 2003a). No direct effects are anticipated because no breeding habitat would be altered under this alternative. Indirect impacts may result from disturbance of approximately 0.14 acres (0.06 ha) of Deciduous Riparian habitat that may be used by migratory individuals (HEG 2003a) for temporary roosting or foraging. Disturbed cottonwood and willow habitat within this area would be mitigated at a 2:1 ratio. Thus, this disturbance would be unlikely to adversely affect the species because it would be small in area and temporary in nature.

Sonora Chub (Threatened). Construction of the Western Corridor may affect, but is not likely to adversely affect the Sonora chub (HEG 2003a). No individuals would be directly impacted under this alternative because no construction activities would occur within occupied streams. Construction of the Western Corridor may, however, affect, and is likely to adversely affect, the Sonora chub indirectly through the transport of sediments into Casita Spring and upper Sycamore Canyon. These indirect effects would not be expected to rise to the level of take because BMP erosion control measures would be used to minimize sediment transport (HEG 2003a).

Similarly, no critical habitat for Sonora chub would be directly impacted by project construction. The project is located 1 mi (1.6 km) upstream of Sycamore Creek and Hank and Yank Spring, the closest designated critical habitat. There would be no adverse modification or destruction of Sonora chub critical habitat because of the distance from project structures, and because BMPs would be in place to minimize erosion (HEG 2003a).

USFS Sensitive Species. Construction of the transmission line in the Western Corridor may impact 33 USFS Sensitive Species (Table 4.3–5). Individuals of all 40 species potentially occurring in the Western Corridor may be impacted. However, with the exception of supine bean, these impacts are not likely to result in trend toward listing under the ESA or loss of population viability (HEG 2003a). Surveys for supine bean are recommended to determine potential impacts under this alternative. Should this species be present in the Western Corridor, TEP would consult with USFS to determine appropriate mitigation to avoid impacts that would result in a trend toward listing under the ESA or loss of population viability.

BLM Sensitive Species. Individuals of all 12 BLM Sensitive Species (see Section 3.3.3.1) potentially occurring in the Western Corridor could be impacted. Specific impacts have not been evaluated because of insufficient survey information. However, these impacts are not likely to result in trend toward listing under the ESA or loss of population viability (HEG 2003a).

Wildlife of Special Concern In Arizona. Individuals of all 12 Wildlife of Special Concern in Arizona species (see Section 3.3.3.1) potentially occurring in the Western Corridor could be impacted. Specific impacts have not been evaluated because of insufficient survey information. However, these impacts are not likely to result in trend toward listing or loss of population viability (HEG 2003a).

Arizona Department of Agriculture Plants. Construction of the transmission line in the Western Corridor may impact all of the five plant species listed by the ADA (see Section 3.3.3.1) potentially occurring there. Specific impacts have not been evaluated because of insufficient survey information. These impacts are not likely to result in trend toward listing under the ESA or loss of population viability.

4.3.3.2 *Central Corridor*

Impacts to 7 of the 27 species listed by USFWS would occur under this alternative. Impacts to six of the following species would be the same as those described under Section 4.3.3.1 cactus ferruginous pygmy-owl, Gila topminnow, jaguar, lesser long-nosed bat, Mexican gray wolf, and Pima pineapple cactus. Impacts to southwestern willow flycatcher are described below.

Southwestern Willow Flycatcher (Endangered). Construction of the Central Corridor may affect, but is not likely to adversely affect southwestern willow flycatchers (HEG 2003b). Construction of the Central Corridor may affect, but is not likely to adversely affect, southwestern willow flycatchers (HEG 2003b). Similar to the impacts described in Section 4.3.3.1, no direct effects to breeding habitat would be anticipated because no breeding habitat would be altered under this alternative. Indirect impacts would be unlikely to result from disturbance of Deciduous Riparian habitat where the proposed transmission line crosses Peck Canyon. This habitat is patchy and lacks surface water; thus, it likely would not be used as habitat by migratory individuals of this species (HEG 2003b).

The Central Corridor would pass within 0.5 mi (0.8 ha) of the Santa Cruz River where migratory southwestern willow flycatchers have been documented (HEG 2003b). It is possible that noise from helicopter flights associated with construction activities would disturb southwestern willow flycatchers using suitable habitat along the Santa Cruz River. Any increase in noise would, however, be short term and minimal because of ambient noise levels from nearby Interstate 19. Therefore, the species would not likely be adversely affected (HEG 2003b).

USFS Sensitive Species. Construction of the transmission line in the Central Corridor may impact 25 USFS Sensitive species (Table 4.3–5). Impacts would be similar to those listed under Section 4.3.3.1.

BLM Sensitive Species. Impacts to BLM Sensitive Species would be similar to those described under Section 4.3.3.1 (HEG 2003b).

Wildlife of Special Concern In Arizona. Impacts to Wildlife of Special Concern in Arizona would be similar to those described under Section 4.3.3.1 (HEG 2003b).

Arizona Department of Agriculture Plants. Construction of the transmission line in the Central Corridor may impact six plant species listed (see Section 4.3.3.2) by the ADA as potentially occurring there. These impacts are not likely to result in trend toward listing under the ESA or loss of population viability.

4.3.3.3 *Crossover Corridor*

Impacts to 9 of the 27 species listed by USFWS would occur under this alternative. Impacts to the following nine species would be the same as those described under Section 4.3.3.1: cactus ferruginous pygmy-owl, Chiricahua leopard frog, Gila topminnow, jaguar, lesser long-nosed bat, Mexican gray wolf, Mexican spotted owl, Pima pineapple cactus, and southwestern willow flycatcher.

USFS Sensitive Species. Construction of the transmission line in the Central Corridor may impact 28 USFS Sensitive Species potentially occurring there (see Table 4.3–5). Impacts would be similar to those listed under Section 4.3.3.1.

BLM Sensitive Species. Impacts to BLM Sensitive species would be similar to those described under Section 4.3.3.1 (HEG 2003b).

Wildlife of Special Concern In Arizona. Construction of the transmission line in the Western Corridor may impact all of the 12 Wildlife of Special Concern in Arizona species potentially occurring there. These impacts are not likely to result in trend toward listing under the ESA or loss of population viability (HEG 2003a).

Arizona Department of Agriculture Plants. Impacts would be the same as those described under Section 4.3.3.2.

4.3.3.4 *No Action Alternative*

There would be no impact to special-status species associated with the No Action Alternative. The existing conditions as described in Section 3.3.3 would continue.

4.3.4 Migratory Birds and Raptors

Local movements of birds are difficult to predict since they vary seasonally and annually and are often linked to climatic conditions. For this reason, the number of potential collisions with towers and/or transmission lines cannot be specifically quantified or predicted. Habitat adjacent to specific portions of each of the corridors determines bird abundance and the species present within that portion of the corridor (SWCA 2002a). The estimated acreage of vegetation available to migratory birds is provided in Section 3.3.1.

Some mortality resulting from bird collisions within the transmission line corridor is considered unavoidable. However, anticipated mortality levels are not expected to result in long-term loss of population viability in any individual species or lead to a trend toward listing under the ESA for any of the proposed corridors because mortality levels are anticipated to be low and spread over the life of the transmission line. Electrocution is not expected to be a substantial hazard because the lines would be spaced wider than the largest local raptor's (golden eagle) wing span. Furthermore, TEP would follow the guidelines outlined in *Suggested Practices for Raptor Protection on Powerlines: the State of the Art in*

1996 (APLIC 1996). None of the towers are anticipated to require lights for aircraft avoidance, which has been associated with nighttime collisions (Kerlinger 2000).

Additional impacts to birds listed under the *Migratory Bird Treaty Act* would include impacts to vegetation, an important habitat component. Some areas would be cleared entirely to facilitate construction; in other areas, vegetation may be crushed but left onsite; and in other areas, relatively minimal disturbance would occur due to helicopter placement of towers. At the conclusion of construction, temporary access roads would be closed and revegetated; however, maintenance of the transmission line would require some permanent access roads. In addition, some tall trees and shrubs may need to be removed in portions of the corridor to allow maintenance access.

4.3.4.1 *Western, Central, and Crossover Corridors*

Potential direct effects to migratory birds as a result of the proposed project could include:

- Increased anthropogenic (manmade) noise and visual disturbances during construction
- Disturbance to and loss of foraging, cover, and nesting habitats related to removal of vegetation during construction
- Direct mortality due to collisions with equipment during construction and during maintenance activities after construction is complete

Potential indirect effects to migratory birds as a result of the proposed project under any of the action alternatives could include:

- Increased probability of mortality or harm due to collisions with towers and lines
- Temporary loss of prey during construction
- Reduction in the amount of foraging, cover, and nesting habitats for various species
- Permanent degradation and fragmentation of habitat for various species related to construction of the line and potential for introduction and colonization by nonnative species
- Displacement of some species (including prey base species) which could result in increased competition for resources in nearby populations
- Increased perch site for raptors during nesting and hunting and increase in potential nest platforms. This may lead to an imbalance in the prey base due to increased utilization by one or more raptor speices. Additionally, some studies have confirmed that some species (grassland birds) abandon habitat within 1 mi (1.6 km) or more of tall artificial structures.

4.3.4.4 *No Action Alternative*

There would be no impact to migratory birds and raptors associated with the No Action Alternative.

4.3.5 Coronado National Forest Management Indicator Species

Implementation of the proposed project has the potential to adversely impact Management Indicator Species (MIS) that occur within the Tumacacori EMA of the Coronado National Forest by both direct and

indirect impacts. Potential direct impacts include direct mortality or harm and removal of foraging, cover, and breeding habitats during construction. Indirect impacts include degradation of habitats including an increase in fragmentation, displacement of wildlife into nearby populations resulting in increased competition for resources, and an increased probability of roadkills and tower strikes by bird species.

4.3.5.1 *Western, Central, and Crossover Corridor*

The proposed project is not expected to result in any downward population trends for MIS. Table 4.3–6 provides a summary of the potential habitat acreage that may be impacted.

4.3.5.4 *No Action Alternative*

No impacts to MIS would occur under the No Action Alternative. Existing conditions described in Section 3.3.5 would continue.

4.3.6 Invasive Species

Colonization of land by invasive species typically occurs gradually and inconspicuously. By the time that public awareness develops, the effects are often irreversible and resources may be irretrievably committed, productivity lowered and biodiversity reduced (BLM 1994, Nelson 1995). The expansion of the range of invasive species is largely caused by human activities, which disturb native ecosystems (Sheley 1994, BLM 1994, Harrod 1994). Vegetation removal and ground-disturbing activities create opportunities for colonization by alien plants (Orians 1986, Bazzaz 1983). Additionally, the transportation of seeds can occur inadvertently through human activities or livestock grazing (Nelson 1995). Colonization of invasive species may result in significant ecological effects by disrupting the natural functions and values of an ecosystem.

4.3.6.1 *Western, Central, and Crossover Corridors*

All action alternatives would require clearing of land for access roads, tower pads, and lay down areas, as described in Section 4.1, Land Use. Impacts of the alternatives are described by the area of anticipated new disturbance associated with construction of new access roads, poles, and lay down pads. New disturbances would provide a potential point of entry onto the landscape, which could lead to colonization of undisturbed surrounding land. Measures outlined in the Invasive Management Plan (see the Biological Assessments in Appendices D, E, and F of this EIS) would minimize the introduction and spread of invasive species.

4.3.6.2 *No Action Alternative*

No new ground disturbance would occur; therefore, no invasive species would colonize any of the proposed routes as a result of the No Action Alternative. Existing conditions described in Sections 3.3.6 would continue.

Table 4.3–6. Comparison of Potential Impacts to Habitat Within Coronado Forest Lands for Management Indicator Species for Each Alternative.[a]

Alternative	Cavity Nesters	Riparian Species	Species Needing Diversity	Species Needing Herbaceous Cover	Game Species
Western Corridor	Estimated maximum permanent loss of habitat that has potential to support cavity nesters is as follows: 95 acres of Madrean evergreen woodland, 0.6 acres of desert riparian scrub, and 3 acres of deciduous riparian habitats.	Disturbance or loss of an estimated 0.6 acres of desert riparian scrub and approximately 3 acres of deciduous riparian habitats.	Conversion of approximately 95 acres of Madrean Evergreen Woodland to grass and forb dominated habitats. No overall loss of diversity is anticipated.	Conversion of approximately 95 acres of Madrean Evergreen Woodland to grass and forb dominated habitats.	Potential increases in forage and decrease in cover and uninterrupted travel corridors due to conversion of woodlands to grass and forb-dominated habitats.
Central Corridor	Estimated maximum permanent loss of habitat that has potential to support cavity nesters is as follows: 38 acres of Madrean evergreen woodland, 0.1 acres of desert riparian scrub, and 0.05 acres of deciduous riparian habitats.	Disturbance or loss of an estimated 0.1 acres of desert riparian scrub and an estimated 0.05 acres of deciduous riparian habitats.	Conversion of approximately 38 acres of Madrean Evergreen Woodland to grass and forb dominated habitats. No overall loss of diversity is anticipated.	Conversion of approximately 38 acres of Madrean Evergreen Woodland to grass and forb dominated habitats.	Potential increases in forage and decrease in cover and uninterrupted travel corridors due to conversion of woodlands to grass and forb-dominated habitats.
Crossover Corridor	Estimated maximum permanent loss of habitat that has potential to support cavity nesters is as follows: 72 acres of Madrean evergreen woodland.	Disturbance or loss of approximately 20 acres of desert riparian scrub and an estimated 4.1 acres of deciduous riparian habitats.	Conversion of approximately 72 acres of Madrean Evergreen Woodland to grass and forb dominated habitats. No overall loss of diversity is anticipated.	Conversion of approximately 72 acres of Madrean Evergreen Woodland to grass and forb dominated habitats.	Potential increases in forage and decrease in cover and uninterrupted travel corridors due to conversion of woodlands to grass and forb-dominated habitats.

[a] Estimates of potential impact are based on an estimated 125-ft (38-m) wide construction corridor. In some areas, access would be attained through the use of helicopters, and placement of the towers would require fewer disturbances to habitat.